

Seedling anatomy of *Lupinus*.—BECQUEREL¹⁵ has studied the development of the lupine (*L. albus* and *L. luteus*), applying to this plant the "dynamic" method, by which he correlates the diverse results of other botanists and shows how these differences have arisen. He also utilizes his results to combat various current views of the transitional region of the seedling. This "dynamic" method is much in vogue among a group of French botanists, headed by CHAUVEAUD. Instead of taking a seedling of no definite age, plants of all ages and stages in development are studied and compared. This is the method of necessity employed in studying animal development, but has been considered of little importance in plants, because of the slight amount of "making over" of vegetable tissues which is possible. BECQUEREL, however, does claim that a most important change of this nature takes place in the hypocotyl—the *absorption* of the primary wood, which in the young plant comes up very high in the cotyledonary region and in the older plant is not found at all in the same region and only in a vestigial condition at a lower level. This variation in structure has no doubt led, as BECQUEREL claims, to the diverse statements as to the height at which the traces of root structure have been found by different investigators, but that it is due to the absorption of the primary wood and has the phylogenetic significance that BECQUEREL ascribes to it cannot be accepted on the evidence presented. I find no statement to indicate that BECQUEREL has taken into account a very obvious and natural cause for the disintegration of the primary wood. There is a rapid enlargement and elongation of the elements in the hypocotyl, in contrast to the merismatic activity of the more apical parts. In this growth the tracheary elements naturally cannot take part, and in consequence become dissociated and disorganized, their function being assumed by the secondary elements which now appear. Again, BECQUEREL'S statement that these elements have disappeared by reason of absorption, as in animal tissues, postulates the presence of an enzyme such as hadromase, and this has not been shown to occur in any plants except the xylophilous fungi.

The objections that BECQUEREL raises to the current views of the transition region between stem and root will lead, no doubt, to clearer ideas and wording of the subject in future texts.—R. B. THOMSON.

Sea-water and the distribution of plants.—The discovery of any efficient means of determining in a quantitative manner the factors limiting the extent and composition of various plant associations must be regarded as an important contribution to ecology. In salt marshes the concentration of salt in the soil water has long been regarded as a limiting factor, and now HARSHBERGER¹⁶ has

¹⁵ BECQUEREL, P., L'ontogénie vasculaire de la plantule du lupin. Ses conséquences pour certaines théories de l'anatomie classique. Bull. Soc. Bot. France 60: 177-186. pl. 4. figs. 5. 1913.

¹⁶ HARSHBERGER, J. W., An hydrometric investigation of the influence of sea-water on the distribution of salt marsh and estuarine plants. Proc. Amer. Phil. Soc. 50:457-496. pls. 2. figs. 7. 1911.

measured this concentration by means of a convenient type of hydrometer, made the necessary corrections for temperature, and has been able to determine the limiting degrees of salinity which the dominant salt marsh plants of the New Jersey coast are able to withstand. Among the species able to grow in water containing over 1 per cent of sodium chloride, *Salicornia herbacea*, *Distichlis spicata*, and *Limonium carolinanum* seem to have the smallest range of accommodation; while *Spartina stricta maritima*, *S. patens*, and *Juncus Gerardi* show the widest limits. *Typha angustifolia* cannot grow in water that approximates a sodium chloride content of 1 per cent, and in much less dilute solutions shows the detrimental effect of the salt. From a large number of determinations, the height of the plants and the size of their spikes are shown to vary inversely with the concentration of the water in which they developed, the optimum condition being entirely fresh water. The paper contains other valuable data and points the way for intensive studies of the vegetation of salt marshes and alkaline soils.

A few notes on the deposits shown in sections of the salt marsh soil indicate a definite succession in the former vegetation similar to that at present in progress, and that there has been a progressive submergence of the marsh either from a change of tidal level, as held by JOHNSON,¹⁷ or from a general subsidence of the entire coast line, as is believed by most investigators.—GEO. D. FULLER.

Queensland ferns.—Dr. F. M. BAILEY, the veteran colonial botanist of Queensland, Australia, has just published an interesting review¹⁸ of DOMIN'S work on Queensland plants, so far as it concerns ferns and fern allies.¹⁹ The new species and varieties, as well as species new to Queensland, are listed, often with descriptions. The notable feature of the review is the almost constant criticism of DOMIN'S new species and varieties. For example, in regard to *Psilotum triquetrum* Sw. var. *fallacinum* Domin, he says that "the distinctions given seem only those of growth and situation"; *Selaginella flabellata* F. v. M. var. *brevispica* Domin "is scarcely worthy of a distinctive name"; *Marattia oreades* Domin "can hardly be separated from that very variable species *M. fraxinea* Sm."; in regard to two new varieties of *Platynerium alcicorne* and one new variety of *P. grande* he says that "it is scarcely advisable to attach names to isolated plants of *Platynerium*, particularly as differences in their growth and form are so often caused by situation." "Finally," says BAILEY, "I think that

¹⁷ JOHNSON, D. W., The supposed recent subsidence of the Massachusetts and New Jersey coasts. *Science N.S.* 32:721-723. 1910; also Botanical evidence of coastal subsidence. *Science N.S.* 33:300-302. 1911; also *BOT. GAZ.* 56:449-468. 1913.

¹⁸ BAILEY, F. M., Contributions to Queensland flora. *Bot. Bull.* no. 17. pp. 14. 1913.

¹⁹ DOMIN, K., Beiträge zur Flora und Pflanzengeographie Australiens I. Abt. Pteridophyta (Prodromus einer Farnflora Queensland). Stuttgart. 1913.